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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,861	03/31/2005	Tetsuji Shibata	HOK-0270	1482

23353 7590 10/31/2007

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EXAMINER	
CROWELL, ANNA M	
ART UNIT	**PAPER NUMBER**
1792	
MAIL DATE	**DELIVERY MODE**
10/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/529,861	SHIBATA ET AL.	
	Examiner	Art Unit	
	Michelle Crowell	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *4,6,10-12,18,20-26 and 28* is/are withdrawn from consideration.

5)☒ Claim(s) *27* is/are allowed.

6)☒ Claim(s) *1-3,5,7-9,13-17,19 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/05 & 09/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Claims 4, 6, 10-12, 18, 20-26 and 28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement of Species II-Figure 2b in the reply filed on July 30, 2007.

The traversal is on the ground(s) that the search and examination of the entire application would not place a serious burden of the Examiner. This is not found persuasive because the search and examination of the entire application would place a serous burden o the Examiner since the search required for the features of the elected species is not co-extensive with the search required for the features of the non-elected species.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

The information disclosure statement filed September 13, 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. In the instant case, references JP 11-054296 & German Office Action dated July 17, 2006 have not been considered.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 recites the limitation, "the electrodes are neutral grounded". On page 13, lines 8-14, elected species II-Figure 2b recites one grounded electrode 3. On page 27, lines 13-28, nonelected species recites a neutral grounded electrode. It should be noted that claim 29 is indefinite since it is unclear whether there is a distinction between a **grounded** electrode and a **neutral grounded** electrode. In addition, it is unclear whether both electrodes are grounded or simply one.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 5, 8, 13, 19, and 29 rejected under 35 U.S.C. 102(b) as being anticipated by Horiike et al. (U.S. 5,185,132).

Referring to Figures 1-3 and column 2, line 56-column 4, line 61, Horiike et al. discloses a plasma treatment apparatus for activating a plasma generation gas by a discharge, and spraying an activated plasma generation gas on an object, the apparatus having a reaction vessel formed by an insulating member 2, 5 and comprising a plurality of through holes 13 (col. 2, line 59-col. 3, line 4), each of which has an inflow opening 12 for the plasma generation gas at its one end, and an outflow opening 15 for the activated plasma generation gas at its opposite end, and electrodes 6 for developing the discharge in each of the through holes (col. 3, lines 9-16).

With respect to claim 2, the plasma treatment apparatus of Horiike et al. further includes wherein the insulating member is configured in the form of a plate 5 (Fig. 2).

With respect to claim 5, the plasma treatment apparatus of Horiike et al. further includes wherein the electrodes are not exposed to the interiors of the through holes (Fig. 2).

With respect to claim 8, the plasma treatment apparatus of Horiike et al. further includes wherein an interval between the electrodes is 4 mm (col. 4, line 66-col. 5, line 2).

With respect to claim 13, the plasma treatment apparatus of Horiike et al. further includes wherein the insulating member is made of a ceramic (col. 3, lines 35-37).

With respect to claim 19, the plasma treatment apparatus of Horiike et al. further comprising gas supply means 1 configured to supply a gas containing at least one of a noble gas or a mixed gas of two or more of them into the reaction vessel as the plasma generation gas (col. 4, lines 3-20).

With respect to claim 29, the plasma treatment apparatus of Horiike et al. further includes wherein the electrodes 41 are neutral grounded (col. 3, lines 28-30).

5. Claims 1-3, 5, 8, 13, 16, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Denes et al. (U.S. 6,764,658).

Referring to Figures 1-3 and column 6, line 1-column 9, line 32, Denes et al. discloses a plasma treatment apparatus for activating a plasma generation gas by a discharge, and spraying an activated plasma generation gas on an object, the apparatus having a reaction vessel formed by an insulating member 114, 122, 138, 148 (col. 6, lines 33-61, col. 8, lines 5-19), and comprising a plurality of through holes 142 (Fig. 1, col. 6, lines 9-15), each of which has an inflow opening 144 for the plasma generation gas at its one end, and an outflow opening 146 for the activated plasma generation gas at its opposite end, and electrodes 130, 140 for developing the discharge in each of the through holes (col. 7, lines 1-21).

With respect to claim 2, the plasma treatment apparatus of Denes et al. further includes wherein the insulating member is configured in the form of a plate 114, 122, 148 (Fig. 1).

With respect to claim 3, the plasma treatment apparatus of Denes et al. further includes wherein the electrodes 130, 140 are embedded in the insulating member 138, 148 (Figs. 1 and 3).

With respect to claim 5, the plasma treatment apparatus of Denes et al. further includes wherein the electrodes 130, 140 are not exposed to the interiors of the through holes 142 (Fig. 3).

With respect to claim 8, the plasma treatment apparatus of Denes et al. further includes wherein an interval between the electrodes is in a range of 0.01 to 5 mm (col. 10, lines 37-40).

With respect to claim 13, the plasma treatment apparatus of Denes et al. further includes wherein the insulating member is made of a ceramic (col. 10, lines 42-47).

With respect to claim 16, the plasma treatment apparatus of Denes et al. further includes comprising an electric power source for applying a voltage with a frequency of 60 Hz between the electrodes (col. 7, lines 15-20).

With respect to claim 19, the plasma treatment apparatus of Denes et al. further comprising gas supply means 108 configured to supply a gas containing at least one of a oxygen gas or a mixed gas of two or more of them into the reaction vessel as the plasma generation gas (col. 7, lines 22-26, col. 10, lines 57-64, col. 11, line 9).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 7, 9, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes et al. (U.S. 6,764,658) in view of Kim et al. (U.S. 2003/0070760).

The teachings of Denes et al. have been discussed above.

Denes et al. fail to teach the electrodes are disposed such that the electric flux lines flow parallel to the direction of the plasma generation gas.

Referring to Figures 3A & 3B and paragraph [0038], Kim et al. teaches a plasma treatment apparatus wherein the electrodes 161 and 165 are disposed such that the electric flux lines flow parallel to the direction of the plasma generation gas. In addition, mere rearrangement of parts which does not modify the operation of a device is prima facie obvious. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). In re Kuhle, 526 F.2d 553, 188 USPQ

7 (CCPA 1975). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to rearrange the electrodes of Denes et al. so that the electric flux lines flow parallel to the direction of the plasma generation gas since it is simply an alternate and obvious matter of design choice that would still yield plasma.

Denes et al. fail to specifically teach that the openings of the through holes have a diameter of 0.01 to 15 mm.

Referring to paragraph [0038], Kim et al. teaches a plasma treatment apparatus wherein the openings of the through holes have a diameter of 0.01 to 15 mm. It is conventionally known in the art to appropriately size a gas through hole in order to achieve the desired gas flow. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the hole size of Denes et al. to have a diameter of 0.01 to 15 mm as taught by Kim et al. in order to achieve the desired gas flow In addition, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)).

Denes et al. fail to teach that the electrodes are neutral grounded.

Referring to paragraph [0038], Kim et al. teaches that one of the electrodes 165 is grounded. It is conventionally known in the art to ground one electrode in order to achieve the desired plasma. Thus, it would have been obvious to one of ordinary skill in the art at the time of

the invention to ground the electrode of Denes et al. as taught by Kim et al. since it's an alternate design that would achieve the desired plasma

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Denes et al. (U.S. 6,764,658) in view of Dornfest et al. (U.S.5,959,409).

The teachings of Denes et al. have been discussed above.

Denes et al. fail to teach that the insulating member is made of alumina.

Referring to column 4, line 46-column 5, line 10, Dornfest et al. teach a plasma processing apparatus wherein it is known in the art for an insulating member to be made of alumina since the material possesses good thermal shock resistance, good thermal conductivity, good wear rate when exposed to plasma environments, and good dielectric properties. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the insulating member of Denes et al. to be made of alumina as taught by Dornfest et al. since the material possesses good thermal shock resistance, good thermal conductivity, good wear rate when exposed to plasma environments, and good dielectric properties.

10. Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes et al. (U.S. 6,764,658) in view of Hayashi et al. (U.S.5,578,130).

The teachings of Denes et al. have been discussed above.

Denes et al. fail to teach an electric power source for applying a pulse-like voltage with a duty ratio of 0.01 to 80%.

Referring to column 5, line 8-43, Hayashi et al. teach a plasma processing apparatus wherein an electric power source for applying a pulse-like voltage with a duty ratio of 0.01 to 80% is applied in order for a good coating to be grown at a high speed. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the electric power source of Denes et al. to apply a pulse-like voltage with a duty ratio of 0.01 to 80% as taught by Hayashi et al. in order for a good coating to be grown at a high speed.

Allowable Subject Matter

11. Claim 27 is allowed.

12. The following is a statement of reasons for the indication of allowable subject matter: The prior art, either singly or in combinations, fails to anticipate or render obvious a plasma treatment apparatus comprising: a pair of electrode plates having a plurality of through holes; an insulating plate having a plurality of through holes, which is disposed between said electrode plates such that positions of the through holes of said electrode plates correspond to the positions of the through holes of said insulating plate; gas supply means configured to supply a plasma generation gas into a plurality of discharge spaces formed by the through holes of said electrode plates and the through holes of said insulating plate; and voltage applying means configured to apply a voltage between said electrode plates to generate plasmas of the plasma generation gas simultaneously in said discharge spaces.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim et al.'323, Morita'688, and Kim'616 teach a plurality electrode plates with through holes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-Th (9:30 -6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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